UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 66520

TWNS NO. 51 (220th STREET)

OVER THE

STRAIGHT RIVER

DISTRICT 6 - RICE COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 66520, Piers 1 and 2, were found to be in good to satisfactory condition with no defects of structural significance observed. The channel bottom appeared stable with no significant scour, although with a heavy accumulation of timber debris present at Pier 1.

INSPECTION FINDINGS:

(A) A heavy accumulation of 2-foot-diameter and smaller timber debris was observed at the two upstream columns and the downstream column of Pier 1 that extended from the channel bottom up to 3 feet above the waterline.

(B) The concrete encasements surrounding the columns at Piers 1 and 2 from the waterline to the channel bottom varied in thickness from 1 to 6 inches with respect to the face of the columns due to improperly centered formwork during construction. In addition, the encasements exhibited irregularities (embedded formwork) in the concrete surfaces with up to 6 inches of penetration.

RECOMMENDATIONS:

(A) The heavy accumulation of timber debris at Pier 1 should be removed during routine maintenance.

(B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 66520

Feature Crossed: Straight River

Feature Carried: TWNS No. 51

Location: District 6 - Rice County

Bridge Description: The bridge consists of three spans of multiple steel stringers supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and two reinforced concrete piers. The piers are labeled Piers 1 and 2 starting from the east end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Daniel G. Stromberg, P.E., S.E.

Dive Team: Clayton G. Brookins, Valerie Roustan

Date: October 23, 2007

Weather Conditions: Sunny, 55°F

Underwater Visibility: 1.0 foot

Waterway Velocity: 2.0 f.p.s

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: The piers each consist of four round concrete columns supporting an oblong concrete pier cap.

Maximum Water Depth at Substructure Inspected: Approximately 5.1 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the south end of Pier 1.

Water Surface: The waterline was approximately 10.9 feet below reference.
Waterline Elevation = 89.1

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 6

Item 61: Channel and Channel Protection: Code 5

Item 92B: Underwater Inspection: Code B/10/07

Item 113: Scour Critical Bridges: Code I/Unknown

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____Yes X No

Photograph 1. Overall view of the Bridge, Looking West.

Photograph 2. View of Pier 1, Looking West. Note the heavy accumulation of timber debris.

Photograph 3. View of Pier 2, Looking East.

Photograph 4. View of the irregular concrete encasement at the upstream column at Pier 2, Looking Northwest. Note inconsistent placement with respect to column and form boards left in concrete.

INSPECTION NOTES:

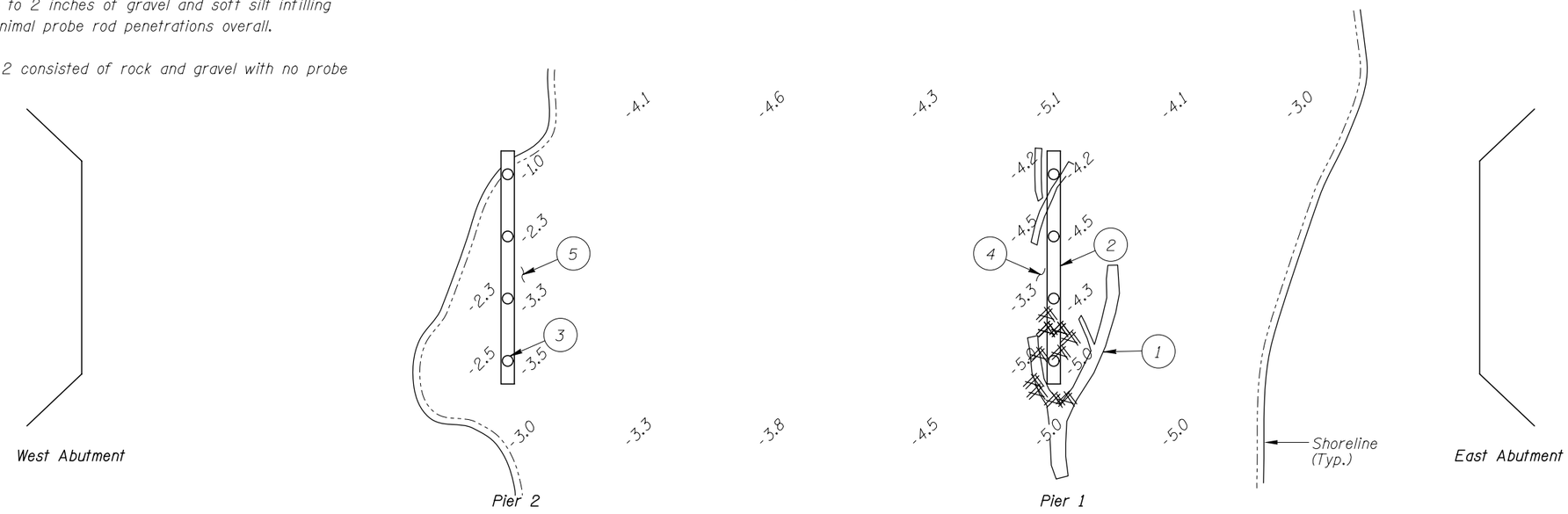
1. A heavy accumulation of 2-foot-diameter and smaller timber debris was observed at the two upstream columns and the downstream column of Pier 1 that extended from the channel bottom up to 3 feet above the waterline.

2. The tops of the concrete encasements at Pier 1 were located approximately 6 inches below the waterline. The encasements varied in thickness from 1 to 6 inches with respect to the face of the columns and exhibited form irrgularities (embedded form boards) with up to 3 inches of penetration.

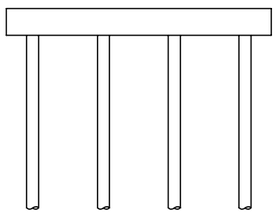
3. The tops of the concrete encasements at Pier 2 were typically located 6 to 10 inches above the waterline. The encasements varied in thickness from 1 to 6 inches with respect to the face of the columns and exhibited form irrgularities (embedded form boards) with up to 6 inches of penetration.

4. The channel bottom at Pier 1 consisted of bedrock at the upstream and downstream columns with up to 2 inches of gravel and soft silt infilling along the middle columns. Minimal probe rod penetrations overall.

5. The channel bottom at Pier 2 consisted of rock and gravel with no probe rod penetration.



SOUNDING PLAN



TYPICAL PIER ELEVATION

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection, on October 23, 2007, the waterline was located approximately 10.9 feet below the top of the pier cap at the downstream end of Pier 1. Since insufficant bridge elevation information was available, a reference elevation of 100.0 was assumed. Based on the assumed reference, the waterline elevation was 89.1.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units as well as around the pier structures.

Legend

-0.4	Sounding Depth (10/23/07)
	Timber Debris

Note:

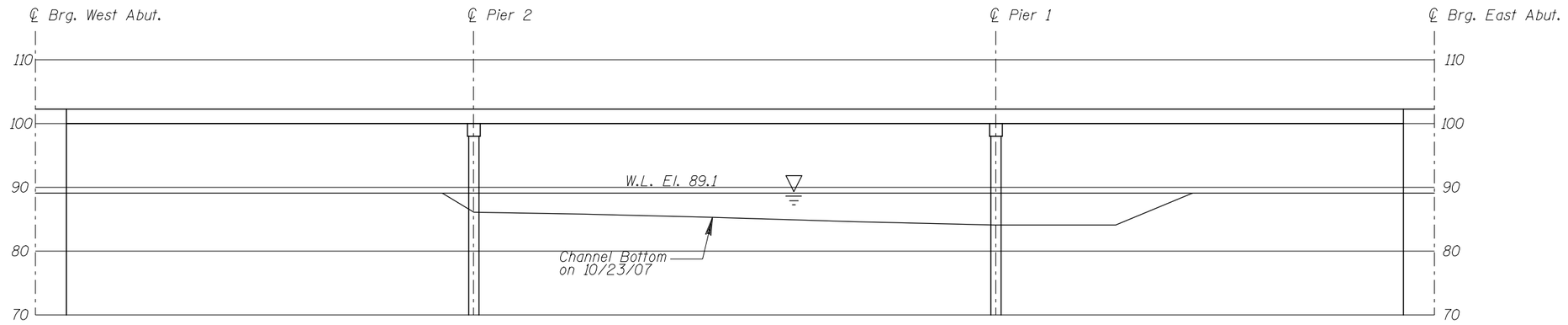
All soundings based on 2007 waterline location.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

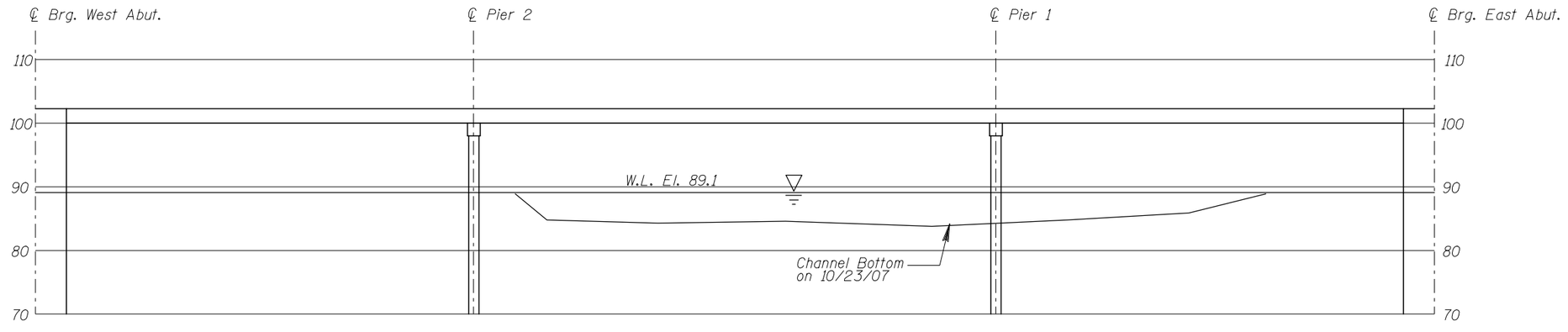
STRUCTURE NO. 66520
OVER THE STRAIGHT RIVER
DISTRICT 6, RICE COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: CAI	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, Il. 60606 (312) 704-9300 www.collinsengr.com	Date: OCT. 2007
Checked By: MDK		Scale: NTS
Code: 52216520		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

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UPSTREAM AND DOWNSTREAM
FASCIA PROFILES

Drawn By: CAI	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: OCT. 2007
Checked By: MDK		Scale: 1"=20'
Code: 52216520		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: October 23, 2007

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E., S.E.

BRIDGE NO: 66520 WEATHER: Sunny, 55°F

WATERWAY CROSSED: Straight River

DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR

_____ OTHER _____

PERSONNEL: Clayton G. Brookins, Valerie Roustan

EQUIPMENT: Scuba, Sounding Pole, Lead Line, Probe Rod, Camera, Scraper

TIME IN WATER: 9:20 a.m.

TIME OUT OF WATER: 9:50 a.m.

WATERWAY DATA: VELOCITY 2.0 f.p.s

VISIBILITY 1.0 foot

DEPTH 5.1 feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: A heavy accumulation of timber debris was observed at Pier 1 (upstream and downstream ends) that consisted of 2-foot-diameter and smaller logs and branches that extended from the channel bottom up to 3 feet above the waterline. The concrete encasements surrounding the base of the columns at Piers 1 and 2 near the channel bottom varied in thickness from 1 to 6 inches with respect to the face of the columns due to improperly centered formwork during construction. In addition, the encasements exhibited irregularities (form boards left embedded in concrete) in the concrete surfaces with up to 6 inches of penetration.

FURTHER ACTION NEEDED: X YES _____ NO

The heavy accumulation of timber debris at Pier 1 should be removed during routine maintenance.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 66520
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
WATERWAY CROSSED Straight River

INSPECTION DATE October 23, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (ENCASEMENTS)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	5.1	N	7	N	9	6	6	8	8	8	5	5	7	N	N	N	N	N
	Pier 2	3.5’	N	7	N	9	6	6	8	8	8	N	8	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

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NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.